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Mind-Body Medicine and the Treatment of Chronic Illnesses

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Abstract

Mind-body medicine is a holistic approach that aims to increase a healthy life style of people and their resilience. Practically, mind-body medicine encompasses intervention methods such as mindfulness, physical exercise, coping with stress, or cognitive restructuring. Mind-body medicine has proven effective for a variety of chronic illnesses, especially in combination with conventional medicine. The present article introduces basic concepts of mind-body medicine including aspects of mindfulness.

Keywords: Stress management, lifestyle modification, chronic illnesses

Zusammenfassung

Die Mind-Body-Medizin ist ein ganzheitlicher Ansatz, welcher darauf abzielt, einen gesunden Lebensstil zu fördern und die Resilienz einer Person zu stärken. Praktisch umfasst die Mind-Body-Medizin Interventionsmethoden wie Achtsamkeit, Bewegungsaktivität, Umgang mit Stress oder kognitive Umstrukturierung. Die Mind-Body-Medizin hat sich, vor allem in Kombination mit der konventionellen Medizin, als effektiv bei einer Reihe von chronischen Erkrankungen erwiesen. Der vorliegende Artikel führt in die grundlegenden Konzepte der Mind-Body-Medizin und Achtsamkeit ein.

Schlüsselwörter: Stressmanagement, Lebensstilveränderung, chronische Krankheiten

Introduction

The daily choices people make with respect to diet, physical activity, substance abuse, sexual behavior, and the way they deal with stress are the most prominent domain of influence over health prospects in the United States [1]. Conventional medicine focusses primarily on preventing, diagnosing, and treating diseases. In complement, mind-body medicine aims to empower patients through healthy lifestyle modifications and aims to increase their active role in their self-care [2]. The National Institute of Health (NIH) in Washington D.C. defines mind-body medicine as follows: “Mind/body medicine focuses on the interactions among the brain, mind, body, and behavior, and the powerful ways in which emotional, mental, social, spiritual, and behavioral factors can directly affect health. It regards as fundamental an approach that respects and enhances each person’s capacity for self-knowledge and self-care, and it emphasizes techniques that are grounded in this approach” [2]. As mind-body medicine techniques the NIH names intervention methods such as relaxation techniques, hypnosis, imagination exercises, meditation, yoga, tai-chi, qigong, cognitive-behavioral techniques, group support, and autogenic training [2].

The origin of mind-body medicine can be traced back to the beginning of the physiological and psychological stress research. Selye distinguishes between the stressors or causes of stress and the stress reactions [3]. The stressors can originate from outside, such as noise, or arise within the person (e.g., perfectionism). The stress reaction can be on different levels: body (e.g., muscle tension), thoughts (e.g., “I cannot stand this anymore”), feelings (e.g., anxiety), and behavior (e.g., excessive eating or working). Stress has many positive functions, including promoting increased physical and mental performance in the short-term [4]. However, stress becomes a problem when the accrued stress hormones in the body are not decomposed or the arousal reaction cannot be regulated down any more. A number of diseases can be caused by chronic stress states, such as indigestions, sleep disorders, states of exhaustions, tension headache, neck pain, heart diseases, bronchial asthma, nervous diseases, and anxiety states [2]. Richard Lazarus recognized that it is not primarily the situation per se that causes stress but the subjective appraisal of one’s own coping resources [5]. Mind-body medicine was also strongly influenced by the work of Aaron Antonovsky who termed the salutogenesis as the search for the origins of health rather than the causes of disease. He found that people who can integrate situations, despite adversities, meaningful in their life and see them as challenges rather than burdens (strong sense of coherence) are more likely to feel less stressed [6]. Pioneering were also the works of Herbert Benson who is the founder of the Institute for Mind Body Medicine at Massachusetts General Hospital in Boston [7] and coined the term “relaxation response”, as the opposite of the “fight or flight” or stress response. He found that practitioners of meditation can slow their breathing, decrease their oxygen consumption, lower their blood pressure, and slow their heart rate [8]. Jon Kabat-Zinn, another influential scientist, has been examining the effect of mindfulness meditation among patients with chronic illnesses. He found that patients participating in his 8-week Mindfulness-Based Stress Reduction (MBSR) training reported less pain, depression [9], and anxiety [10]. Moreover, their skills to cope with stress increased [11]. He also found, that patients with psoriasis recovered faster compared to a control group when prac-

ticing mindfulness exercises in addition to standard medications and light therapy [12]. Finally, Dean Ornish established a program for cardiovascular patients focusing on diet change, meditation, yoga, stamina training, and compassion for themselves and others. It has been demonstrated that severe pathological heart diseases improved by attending the Ornish lifestyle program [13].

The Essener model of mind-body medicine

In Germany, mind-body medicine was established at the department of Complementary and Integrative Medicine at the Kliniken Essen-Mitte in 1999. In this model institution, the so called “Essener Model”, physicians additionally specialized in complementary medicine and mind-body instructors are working together using an integrative approach [2]. The key components of mind-body medicine in the Essener Model are presented in the “Temple of health” [2] (see Figure 1). The pillars of the temple represent the lifestyle aspects, which are expressed directly in our bodily behaviour: Movement or physical exercise, active relaxation, breathing, nutrition, and naturopathic self-care methods. In general, moderate physical activity (e.g., walking, cycling, or swimming) for 20 to 30 minutes per day is recommended. This can be done in one session or broken up into 10 minutes sessions. Active relaxation, such as progressive muscle relaxation, guided imagery, or autogenic training, for 30 minutes a day has been found to lower levels of stress hormones [14]. In this model, breathing not only includes techniques, such as the belly breathing or mini relaxation techniques, but also to pause for breath during the day. In the clinic in Essen, patients are introduced into the mediterranean whole-food nutrition that has shown to have positive effects on overall health [2]. The naturopathic self-care includes home remedies such as the use of hydrotherapy, compresses, or herbs. The model explicitly focuses also on psychological aspects, as, for example thoughts, emotions, and meaning in life, as well as social aspects, such as family, social contacts, and occupation, which are represented in the roof of the temple. For example, in mind-body medicine, people learn how to deal with difficult thoughts and emotions through cognitive restructuring techniques [15] or to reflect their social network and communication. The scale underneath the roof is symbolic for striving for balance, rather than extremes in all parts of the tem-

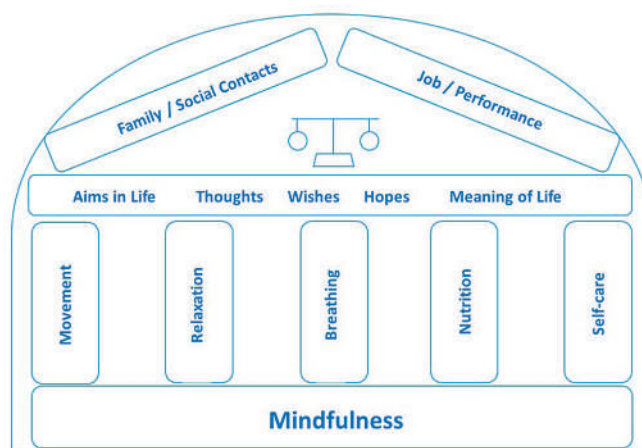


Figure 1: Temple of health translated and adapted from Dobos and Paul (2011)

ple. Coping with stress and the development of mindfulness, which will be explained in detail below, play thereby a fundamental role. In mind-body therapies, the patients explore where they have potential to increase their health through lifestyle modifications.

Health-promoting behavior change

The motor for a healthy lifestyle modification is not the conviction of the mind-body therapist but rather the insights and motivation of the patient himself or herself. It is therefore imperative for the therapist to understand in which stage of behavior change the patient is [2]. According to the trans-theoretical model of Prochaska and DiClemente [16], each person has to pass different stages to change behavior: In the stage of *precontemplation* the person sees no reason to change his or her health behaviour. The person wants to stay as he or she is. For example a person who smokes says: “My grandfather was a chain-smoker and became 98 years old.” In the stage of *contemplation* the person actively deals with his health behavior, but is very ambivalent toward a change. For instance, the patient says: “I know that I should exercise more, but I feel too tired after work.” Whether the person shifts from a “yes, but...” to a clear “yes” depends on one side on how important the behavior change is for him or her and on the other side how confident the person is that he or she can maintain the new behavior under difficult circumstances. In the stage of *preparation* the patient is motivated to change his behavior and has already made first steps. For instance, the patient did not smoke for two days, he did sign up for a relaxation course, or he did buy a book about whole-food diet. In order to come from a high motivation into an *action*, a clear goal is needed. A possible aim could be “Starting next week, I will go for a walk for 45 minutes every Monday and Wednesday right after work”. Besides the formulation of an active, realistic, and measureable aim it is also important to look at possible obstacles and barriers that could occur as well as what could facilitate to maintain the behavior (e.g., social support, reward system, experience of positive changes). For the walking example, a common barrier is that it is raining and the person is not motivated to go outside. A possible countermeasure could be to actively remember the good feeling that arises after the walk. The patient is in the *termination* stage when he did maintain the behavior change for more than six months. Important in this stage is to address and normalize the fall back into old behaviors (especially during stressful times) and to see these as opportunities to refine the strategies to keep going.

Stages	Description
Precontemplation	No intention to change behavior.
Contemplation	Ambivalence: “Yes, but...”
Preparation	First steps toward a behavior change.
Action	Behavior changed for longer than one day, but less than six months.
Termination	Behavior changed for more than six months.

Table 1: Stages of behavior change after Prochaska and DiClemente (1983)

Mindfulness

Mindfulness can be defined as paying attention to the present moment, on purpose and without judgment, with an attitude of affection, curiosity, and kindness [17]. It includes seeing things as if for the first time, with a so called beginner’s mind, a quality which can be well observed in small children. Table 2 illustrates the attitudinal foundation of mindfulness practice after Kabat-Zinn.

Attitudinal foundation	Description
1. Non-judging	Impartial witnessing, observing without evaluation, and categorization.
2. Patience	Allowing things to unfold in their own time, bringing patience to ourselves and others.
3. Beginner’s Mind	Seeing things as if for the first time, being receptive to new possibilities.
4. Trust	Trusting both oneself and the process of self-regulation practice itself.
5. Non-striving	Non-goal oriented, remaining unattached to outcome or achievement.
6. Acceptance	Open to seeing and acknowledging things as they are. It does not mean approval.
7. Letting be (rather than letting go)	Non-attachment and the ability to put aside the tendency to elevate some aspects of our experience and to reject others.

Table 2: The attitudinal foundation of mindfulness practice after Kabat-Zinn (2005)

Kabat-Zinn’s 8-week MBSR program consists of weekly session of approximately 2.5 hours plus one full day of mindfulness in silence, and daily home assignments of about one hour [17]. One of the first exercises in his program is the so called raisin exercise: The participants get three raisins and are asked to imagine that they have just dropped in from Mars and that they have never seen raisins before. Then, they are invited to explore the first two raisins with all their senses (touch, smell, taste etc.) and then to eat the last raisin how they would normally do it. At this point, the participants usually realize that they often do activities during their daily lives without much awareness or on automatic pilot. Another exercise is to check, the next time you take a shower in the morning, whether you are really in the bathroom or whether you are already at work or somewhere else. These exercises help to demonstrate that our mind can often be miles away (in the past or in the future) from what we are doing, right now, in this moment. There are formal and informal practices to bring mindfulness into our lives. The formal practices include: The body scan, mindful yoga, sitting meditation, walking meditation, and self-compassion or loving-kindness meditation. Next, we will describe these in detail.

The *body scan* is a technique to bring awareness into every part of our body, starting from the toes all the way up to the head. A full body scan lasts for approximately 45 minutes and the participants are invited to focus on all sensations

(e.g., warmth, tingling) and to just notice these sensations. Participants will be reminded, that there is no right to feel while they are doing this, and that the way they are feeling, is the way they are feeling in this moment, and that this is OK. The intention is, to let go of the tendency we all have at times, to want things to be different from how they are right now, and to allow things to be exactly as we find them [17]. The primary aim is to be awake and fully present, moment by moment, rather than trying to get relaxed.

The *mindful yoga* uses gentle techniques from the hatha yoga. The hatha yoga seeks to achieve the right balance between exertion and letting go. During the 8-week MBSR program [17] participants get introduced into a standing and a lying yoga sequence of 45 minutes each. The mind-body trainer encourages the participants to listen to their own body and to explore their limits gently, lovingly, and with respect for their body. Often participants get into competing with themselves or they give up early by doing very little, which can be a great source of self-exploration. While in each posture, participants are invited to be aware of the sensations that they are experiencing in various parts of their body and to direct their breath in to and out from the region of greatest intensity in a particular stretch or posture.

In *sitting meditation*, the participants are invited to find a comfortable position either sitting on a chair or coming into a kneeling or cross-legged position on the floor. It is not so much about the way of sitting rather than bringing to the sitting posture itself a sense of dignity with the head, neck and back straight, the shoulders relaxed, and the hands comfortably placed in the lap or on the knees. Then the participants are instructed to bring their awareness to their breathing at the belly or at the nostrils and just being aware of the flow of breathing without changing or manipulating the breath in any way. From time to time, the participants will be reminded that it is natural and normal that the mind will wander of the breath and that the invitation is to simply bring the attention back to the breathing and to be kind and patient with ourselves, no matter how many times the mind wanders of the breath. The sitting meditation can help to build concentration and inner balance.

For the *walking meditation*, the participants are usually asked to find a walkway where they can go up and down for a few steps without getting in someone others way. Then they are invited to stand at the end of their walkway and to bring their awareness to the bottom of their feet. Then the mind-body trainer guides them to lift one heel of the floor and then very slowly start to walk and really being aware of all sensations in their feet and their lower legs. Often the participants discover how much comes into play (e.g., muscles, balance) while walking and that we often take things for granted.

Another form of meditation is *loving-kindness*. Loving-kindness is an English translation of the Pali word metta and means “friendliness”, “love”, “benevolence”, and “good will”. In its fullest expression, metta is “universal, unselfish, all-embracing love” [18]. During this practice the participants are invited to bring their awareness to the heart center and to silently repeat phrases like “May I be happy” or “May I live with ease”. The phrases can then be extended to include benefactors, loved, neutral or difficult persons, and, ultimately, all beings on earth. This practice can open our heart to ourselves and others in a profound way. Sometimes people find it difficult to send compassion to themselves and find it helpful to simply put their hand on their heart and to focus on the warmth of the hand.

Mindfulness can also be practiced during daily activities such as brushing teeth, doing the dishes, or taking a shower by focusing one's attention completely on that activity. These practices are called informal practices. The formal and informal mindfulness practices allow us to come back into the present moment, so we can optimize our capacity to stop habitual, auto-pilot-driven modes of activity, in order to see more clearly, and thus make conscious choices about how to live a healthier and happier life.

Evidence of mind-body medicine and mindfulness

Mind-body programs, ranging from physical exercise, relaxation/biofeedback training, health education, stress management, yoga, or qigong to psychosocial interventions, have proven effective – most often in combination with the conventional medicine – in systematic reviews and meta-analyses with the following health problems: High blood pressure [19–24], rehabilitation and secondary prevention of cardiac cycle diseases [19,25–27], cancer [19,28,29], incontinence [19,30], sleeping disorders [19,31,32], headaches [19,33,34], chronic back pain [19,35,36], chronic inflammatory bowel disease [37,38], menopause-related symptoms [39], and pain and pain-associated disability [40]. There is also evidence for the beneficial effect of mind-body interventions on surgical outcomes [19,41,42]. Systematic reviews and meta-analyses of RCTs support the use of standard MBSR programs to alleviate symptoms, both mental and physical, in the adjunct treatment of cancer, cardiovascular disease, chronic pain, stress, depression, anxiety disorders and in prevention in healthy adults and children [43–45]. Often, the effectiveness of a conventional medication therapy can be optimized through mind-body interventions because the medication dose can be reduced (and thus the side effects), and the “revolving door effect” can be broken through, because patients develop skills to maintain, despite their illness, a high quality of life [2].

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Practical implications

Mind-body therapies can lead to long-lasting healthy life style modifications. Patients suffering from chronic illnesses, such as indigestions, sleep problems, chronic pain, and cardiovascular diseases, should get informed by their health professionals about mind-body techniques as a complement to the conventional medicine.

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References

- McGinnis JM, Williams-Russo P, Knickman J. P. The case for more active policy attention to health promotion. *Health Affairs*. (2002);21(2):78-93.
- Dobos G, Paul A. *Mind-Body-Medizin: Die moderne Ordnungstherapie in Theorie und Praxis*. München: Elsevier.; 2011.
- Selye H. The evolution of the stress concept. *American Scientist*. 1973;61(6):692-9.
- Kaluza G. *Stressbewältigung*. Berlin: Springer; 2011.
- Lazarus RS. *Emotion and adaptation*. New York, NY, US: Oxford University Press; 1991.
- Antonovsky A. *Unraveling the mystery of health: How people manage stress and stay well*. San Francisco, CA, US: Jossey-Bass; 1987.
- Benson-Henry Institute for Mind Body Medicine. <http://www.mass-general.org/bhi/> (accessed 22 August 2016).
- Benson H. *The Relaxation Response*. New York: Avon Books; 1976.
- Kabat-Zinn J, Lipworth L, Burney R, Sellers W. Four year follow-up of a meditation-based program for the self-regulation of chronic pain: Treatment outcomes and compliance. *Clinical Journal of Pain*. 1986;2:159-73.
- Kabat-Zinn J, Massion AO, Kristeller J, Peterson LG, Fletcher KE, Pbert L, et al. Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *The American Journal of Psychiatry*. 1992;149(7):936-43.
- Ockene J, Sorensen G, Kabat-Zinn J, Ockene IS, Donnelly G. Benefits and costs of lifestyle change to reduce risk of chronic disease. *Preventive Medicine*. 1988;17:224-34.
- Kabat-Zinn J, Wheeler E, Light T, Skillings A, Scharf MJ, Cropley TG, et al. Influence of a mindfulness meditation-based stress reduction intervention on rates of skin clearing in patients with moderate to severe psoriasis undergoing phototherapy (UVB) and photochemotherapy (PUVA). *Psychosomatic Medicine*. 1998;60(5):625-32.
- Ornish D, Brown SE, Scherwitz LW, Billings JH, Armstrong WT, Ports TA, et al. Can lifestyle changes reverse coronary heart disease? The Lifestyle Heart Trial. In: Steptoe A, Wardle J, Steptoe A, Wardle J, editors. *Psychosocial processes and health: A reader*. New York, NY, US: Cambridge University Press; 1994. p. 507-21.
- Hoffman JW, Benson H, Arns PA, Stainbrook GL, Landsberg G, Young JB, et al. Reduced sympathetic nervous system responsivity associated with the relaxation response. *Science*. 1982;215(4529):190-2.
- Ellis A. *Grundlagen der Rational-Emotiven Verhaltenstherapie*. München: Pfeiffer; 1993.
- Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of consulting and clinical psychology*. 1983;51(3):390-5.
- Kabat-Zinn J. *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness* (15th anniversary ed.). New York, NY, US: Delta Trade Paperback/Bantam Dell; 2005.
- Salzberg S. *Loving-kindness*. Boston: Shambhala Classics; 2002.
- Astin JA, Shapiro SL, Eisenberg DM, Forsy KL. Mind-body medicine: state of the science, implications for practice. *The Journal of the American Board of Family Practice*. 2003 16(2):131-47.
- Linden W, Chambers L. Clinical effectiveness of non-drug treatment for hypertension: A meta-analysis. *Annals of Behavioral Medicine*. 1994;16(1):35-45.
- Rainforth MV, Schneider RH, Nidich SI, Gaylord-King C, Salerno JW, Anderson JW. Stress reduction programs in patients with elevated blood pressure: a systematic review and meta-analysis. *Current hypertension reports*. 2007;9(6):520-8.
- Yang K. A review of yoga programs for four leading risk factors of chronic diseases. *Evidence-Based Complementary and Alternative Medicine*. 2007;4(4):487-91.
- Yeh GY, Wang C, Wayne PM, Phillips RS. The effect of tai chi exercise on blood pressure: a systematic review. *Preventive cardiology*. 2008;11(2):82-9.
- Yeh GY, Wang C, Wayne PM, Phillips R. Tai chi exercise for patients with cardiovascular conditions and risk factors: a systematic review. *Journal of Cardiopulmonary Rehabilitation and Prevention*. 2009;29(3):152.
- Dusseldorp E, van Elderen T, Maes S, Meulman J, Kraaij V. A meta-analysis of psychoeducational programs for coronary heart disease patients. *Health Psychology*. 1999;18(5):506-19.
- Linden W, Stossel C, Maurice J. Psychosocial interventions for patients with coronary artery disease: a meta-analysis. *Archives of Internal Medicine*. 1996;156(7):745-52.
- Cramer H, Lauche R, Paul A, Langhorst J, Michalsen A, Dobos G. Mind-body medicine in the secondary prevention of coronary heart disease: A systematic review and meta-analysis. *Deutsches Ärzteblatt International*. 2015;112(45):759-67.
- Meyer TJ, Mark MM. Effects of psychosocial interventions with adult cancer patients: A meta-analysis of randomized experiments. *Health Psychology*. 1995;14(2):101-8.
- Pan Y, Yang K, Wang Y, Zhang L, Liang H. Could yoga practice improve treatment-related side effects and quality of life for women with breast cancer? A systematic review and meta-analysis. *Asia-Pacific Journal of Clinical Oncology*. 2017;13(2):e79-e95.
- Weatherall M. Biofeedback or pelvic floor muscle exercises for female genuine stress incontinence: a meta-analysis of trials identified in a systematic review. *BJU international*. 1999;83:1015-6.
- Murtagh DRR, Greenwood KM. Identifying effective psychological treatments for insomnia: A meta-analysis. *Journal of Consulting and Clinical Psychology*. 1995;63(1):79-89.
- Neuendorf R, Wabbeh H, Chamine I, Yu J, Hutchison K, Oken BS. The Effects of Mind-Body Interventions on Sleep Quality: A Systematic Review. *Evidence-Based Complementary and Alternative Medicine*. 2015;2015.
- Haddock CK, Rowan AB, Andrasik F, Wilson PG, Talcott GW, Stein RJ. Home-based behavioral treatments for chronic benign headache: A meta-analysis of controlled trials. *Cephalalgia*. 1997;17(2):113-8.
- Sierpina V, Astin J, Giordano J. Mind-body therapies for headache. *Am Fam Physician*. 2007;76(10):1518-22.
- Cramer H, Lauche R, Haller H, Dobos G. A systematic review and meta-analysis of yoga for low back pain. *The Clinical journal of pain*. 2013;29(5):450-60.
- Van Tulder M, Malmivaara A, Esmail R, Koes B. Exercise therapy for low back pain. *The Cochrane Database of Systematic Reviews*. 1999(2):CD000335-CD.
- Langhorst J, Wulfert H, Lauche R, Klose P, Cramer H, Dobos G, et al. Systematic review of complementary and alternative medicine treatments in inflammatory bowel diseases. *Journal of Crohn's and Colitis*. 2015;9(1):86-106.
- Magge SS, Wolf JL. Complementary and alternative medicine and mind-body therapies for treatment of irritable bowel syndrome in women. *Women's Health*. 2013;9(6):557-67.
- Nedrow A, Miller J, Walker M, Nygren P, Huffman LH, Nelson HD. Complementary and alternative therapies for the management of menopause-related symptoms: a systematic evidence review. *Archives of internal medicine*. 2006;166(14):1453-65.
- Büssing A, Ostermann T, Lütke R, Michalsen A. Effects of yoga interventions on pain and pain-associated disability: a meta-analysis. *The Journal of Pain*. 2012;13(1):1-9.
- Devine EC. Effects of psychoeducational care for adult surgical patients: A meta-analysis of 191 studies. *Patient Education and Counseling*. 1992;19(2):129-42.
- Johnston M, Vögele C. Benefits of psychological preparation for surgery: A meta-analysis. *Annals of Behavioral Medicine*. 1993;15(4):245-56.
- Chiesa A, Serretti A. Mindfulness-based stress reduction for stress management in healthy people: A review and meta-analysis. *The Journal of Alternative and Complementary Medicine*. 2009;15(5):593-600.
- Gotink RA, Chu P, Busschbach JJV, Benson H, Fricchione GL, Hunink MGM. Standardised mindfulness-based interventions in health-care: An overview of systematic reviews and meta-analyses of RCTs. *PLoS ONE*. 2015;10(4).
- Smith JE, Richardson J, Hoffman C, Pilkington K. Mindfulness-Based Stress Reduction as supportive therapy in cancer care: systematic review. *Journal of advanced nursing*. 2005;52(3):315-27.